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ABSTRACT

To determine the relationship between particular reading materials used most frequently with students in grades one through six and the amount of progress students made during the 1982-83 school year, a study was conducted by the District of Columbia Public Schools. Nine of the ten reading materials on the approved textbook list were assessed, and 16,733 students, 42% of the students enrolled in grades one through six, who met the selection criteria were examined. The measure of student progress enlisted was keyed to reading progress. Data revealed that there was no significant difference in the amount of student progress associated with the nine tested texts, that the effectiveness of particular reading materials was not significantly influenced by the sex of the student, and that a particular material may be more effective or less effective at a given grade level depending on the instructional level of the student. (CRH)

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READING TEXTBOOKS AND STUDENT PROGRESS: A STUDY OF READING MATERIALS USED FOR INSTRUCTION IN GRADES ONE THROUGH SIX

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DISTRICT OF COLUMBIA PUBLIC SCHOOLS

READING TEXTBOOKS AND STUDENT PROGRESS: A STUDY OF READING MATERIALS USED FOR INSTRUCTION IN GRADES ONE THROUGH SIX

Prepared by
Division of Quality Assurance
June 1984

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SUMMARY

Purpose of the Study: To determine the relationship between particular reading materials used most frequently with students in grades one through six and the amount of progress students made during school year 1982-83.

Materials Assessed: Nine of the ten reading materials on the District of Columbia Public Schools approved textbook list.*

Students: A total of 16,733 students, or approximately 42% of those enrolled in grades one through six, who met the selection criteria.

Findings:

1. There was no significant difference in the amount of student progress associated with the nine different reading materials on the approved textbook list.
2. There was no evidence that effectiveness of particular reading materials were significantly influenced by the sex of the student.
3. The data suggest that a particular material may be more effective or less effective at a given grade level depending on the instructional level of the student.

* The sample size was insufficient to assess the tenth reading material.

I. INTRODUCTION

Is there evidence of a relationship between the particular reading materials used by teachers to teach reading and the amount of progress made by students during the year?

Data collected in June 1983 on students in grades one through six were used to answer that question. Using data furnished by teachers about the reading materials used most frequently with students and the promotion results for the second semester of school year 1982-83, several statistical analyses were made.

The reading materials evaluated in this report were those recommended by the Superintendent of Schools, and approved by the Board of Education, for use beginning in school year 1981-82.

The analyses and their results are described and summarized in this report.

II. PROCEDURES

A. Students

Evaluation System data collection forms were submitted in June 1983 by 1,575 regular classroom teachers representing 125 schools with an elementary school program. Teachers reported on 39,497 students in grades one through six.

Data reported that were essential to this study were the student's current grade, next semester grade, and next semester reading and mathematics instructional levels according to the Student Progress Plan (SPP).

A total of 16,733 (42.4%) of the 39,497 students were included in the analyses. Students at each of the six grade levels were included if:

1. They had none of the essential data items missing or invalid on the data collection form;
2. They were absent no more than 10 days during the second semester;
3. They were not non-English speaking;
4. Their current reading materials were the same or very similar to that used all year;
5. They were not identified special education students; and
6. They were not identified Chapter 1 students receiving Chapter 1 services.

B. Student Progress

Standardized test performance as a measure of progress during the year would have been preferable. However, the city-wide testing program did not include pre-post testing.

The measure of progress employed in this study was the "next semester" SPP grade level minus the "current" SPP grade level. To make that measure numerical, the SPP letter designations were converted to a four-step scale of .00, .25, .50 and .75. Thus, when this scale is applied to SPP grade level two, for example, we have the following numerical values:

SPP Grade Level	Numerical Values
2AT	2.00
2A	2.25
2BT	2.50
2B	2.75

To apply the scale, consider a students whose "current" grade level was 2BT and whose "next semester" grade was 3A. The measure of progress would be 3A minus 2BT, or 3.25 - 2.50 = .75. Another students whose "current" grade level was also 2BT and whose "next semester" grade level was 2B would show less progress (i.e. 2B minus 2BT, or 2.75 - 2.50 = .25).

Since this study was specifically concerned with reading materials, it was desirable to have the "T" grade reflect a deficit in reading when it was a result of a deficiency in reading. Thus, the general grade status formula used was numerical grade plus "A" or "B" minus "T", where "A" = .25, "B" = .75 and "T" = .25, or 0.

For example, a student was shown to have a "current" grade of 4BT with a reading level of 4A and a mathematics level of 4B. For the purpose of this study the "current" grade level would be changed to a numerical value reflecting the reading deficiency (i.e. 4 plus "B" minus "T", or 4 +.75 - .25 = 4.50). By the same token, a student in 4BT whose reading level was 4B and whose mathematics level was 4A would have a higher numeric grade value (i.e. 4 plus "B" minus "T", 4 +.75 - 0 = 4.75). Thus, the measure of student progress used in this study was keyed to reading progress.

C. Reading Materials

The study was intended to assess the ten reading materials on the approved textbook list. Nine of the materials were assessed. The tenth material was not assessed due to an insufficient sample size.

The ten materials, listed in Table 1 according to the frequency of use accounted for 82% of the 39,497 students in grades one through six.

TABLE 1

TEN APPROVED READING MATERIALS LISTED BY FREQUENCY OF USE, 1982-83

Reading Materials (Publishers)	Number of Students
1. Ginn	7,573
2. MacMillan	7,545
3. Lippincott	3,664
4. Harcourt Brace and Jovanovich	3,039
5. American Book Company	2,849
6. Houghton Mifflin	2,247
7. Holt Rinehart and Winston	2,228
8. Scott Foresman	1,693
9. Allyn and Bacon	1,263
10. Harper and Row	258

D. **Analysis**

In addition to the amount of student progress and reading materials; sex, amount of extra help in reading and the reading instructional level were included as variables.

1. **Statistical Procedures.** The statistical analyses employed in this study were one-way and two-way analysis of covariance (ANCOVA). The variables for these analyses were as listed.

   a. Dependent variable: Amount of student progress

   b. Independent variables:

      (1) Type of reading materials (used in both the one-way and two-way analyses)

(2) Sex (used only in the two-way analyses)

c. Covariates:

(1) Reading instructional level beginning of "current" semester (used in the one-way and two-way analyses)

(2) Amount of extra help in reading (used only in the two-way analyses)

2. Unit of Analysis. In the main analyses, the unit of analysis was the class subgroup. That is, in each classroom at a given grade level, students were divided into subgroups according to their reading materials used most frequently.

In the two-way analyses of covariance the subgroups were further divided according to sex. The means of these subgroups were the measures used in the main analyses.

An additional set of analyses were done with the individual student as the unit of analyses.

III. RESULTS

A. The Main Analyses

The main analyses, used to determine the effectiveness or differences in effectiveness of nine reading materials,[1/] employed the use of subgroups. The group of students in a classroom who were using a particular material became a subgroup of that class. All subgroups at the same grade level who were using the same materials became the sample from which progress measures were computed to determine the effectiveness of the reading material.

Table 2 lists the reading materials analyzed at each grade level for which a sufficient sample of students were present. Also shown are the number of different subgroups using the material at each grade level, the mean progress made by the subgroups using a particular material at each grade level and the standard error of amount of student progress. Means have been adjusted for beginning reading instructional levels.

Across grades the mean progress of students using a particular reading material ranged from a low of .42 in grade three to a high of .59 in grade five. The highest and lowest mean progress for each grade are shown at the bottom of Table 2. The greatest difference between the highest and lowest mean progress of students occurred at grade five. There the highest mean was .59 (associated with Harcourt Brace and Jovanovich) and the lowest was .43 (associated with Allyn and Bacon).

Statistically at the .05 level of confidence, there was no significant effect of type of reading material on amount of student progress at any of the six grade levels.

[1/]The sample size was insufficient to analyze the tenth reading material which was Harper and Row.

TABLE 2

READING MATERIALS ANALYZED AND MEAN PROGRESS OF STUDENTS BY GRADE LEVEL

Reading Materials (Publishers)	Statistics	Grade Levels 1	2	3	4	5	6
1. Allyn and Bacon	Number of Subgroups	—	—	—	—	21	—
	Mean Progress	—	—	—	—	.43	—
	Standard Error	—	—	—	—	.05	—
2. American Book Company	Number of Subgroups	22	27	26	23	25	16
	Mean Progress	.45	.43	.49	.50	.56	.58
	Standard Error	.02	.04	.04	.03	.05	.05
3. Ginn	Number of Subgroups	42	51	57	65	67	41
	Mean Progress	.44	.48	.44	.45	.52	.54
	Standard Error	.02	.03	.03	.02	.03	.03
4. Harcourt Brace and Jovanovich	Number of Subgroups	32	30	21	27	30	19
	Mean Progress	.44	.47	.53	.49	.59	.45
	Standard Error	.02	.04	.04	.03	.04	.05
5. Holt Rhinehart and Winston	Number of Subgroups	15	20	—	16	17	—
	Mean Progress	.49	.51	—	.49	.57	—
	Standard Error	.03	.05	—	.04	.06	—
6. Houghton Mifflin	Number of Subgroups	15	19	24	21	—	15
	Mean Progress	.50	.47	.49	.48	—	.50
	Standard Error	.03	.05	.04	.03	—	.05
7. Lipppincott	Number of Subgroups	27	27	27	29	34	16
	Mean Progress	.45	.48	.42	.54	.49	.55
	Standard Error	.02	.04	.04	.03	.04	.05
8. MacMillan	Number of Subgroups	54	54	57	58	48	34
	Mean Progress	.47	.45	.48	.44	.50	.49
	Standard Error	.02	.03	.03	.02	.03	.03
9. Scott Foresman	Number of Subgroups	—	16	—	21	20	—
	Mean Progress	—	.45	—	.52	.44	—
	Standard Error	—	.05	—	.03	.05	—
All Materials	Largest Number of Classes Represented	54	54	57	65	67	.41
	Highest Mean Progress	.50	.51	.53	.54	.59	.58
	Average Mean Progress	.46	.47	.47	.48	.51	.52
	Lowest Mean Progress	.44	.43	.42	.44	.43	.45

At certain grades and for a given material, the higher the beginning reading instructional level, the greater the progress when subgroups were analyzed. This finding will be further researched for possible instructional implications.

B. Other Analyses

Several other analyses were conducted and the results of each are stated briefly.

1. Subgroups, by sex, adjusted for beginning reading instructional level and amount of extra help in reading revealed:
   a. Tentative indication of effect for reading materials at grades one and six;
   b. No significant effect by sex at any grade level;
   c. Significant relationship of beginning reading instructional level to progress at all grade levels; and
   d. Significant positive relationship of amount of extra help in reading to progress in grades three and five.
2. Individual student progress adjusted for beginning reading instructional level revealed:
   a. A significant effect of type of reading material at each grade level owing mainly to the large sample sizes; and
   b. A significant relationship of beginning reading instructional level to student progress in each grade except grade six.

IV. CONCLUSIONS

Several types of analyses were made in this study. On the surface they may appear to have yielded conflicting results. In particular, the one-way ANCOVAs using subgroups as the unit of analysis indicated no significant effect of reading materials; the two-way ANCOVAs suggested a tentative effect at grades one and six; and the one-way ANCOVAs using the individual as the unit of analysis suggested significant differences at all grade levels. There were also differences in the results of the homogeneity of regression tests between subgroups and individual one-way ANCOVAs. How should these results be interpreted?

It is not unusual for analyses based on different levels of aggregation of the data to give different results. Generalizations from one aggregate level to another are often inappropriate or tenuous at best.

In this study, the results based on the main analyses using subgroup means should be used to guide policy decisions. The results of particular interest in this instance are that there is little practical value and no significant difference in the amount of student progress associated with the nine different reading materials studied.

Results based on analyses using individual measures should be considered primarily for their potential operational implications. The data suggest that the same material may be more effective or less effective (by the measure used in this study) at a given grade level depending on the identified reading instructional level of the student. A separate report is planned detailing these interactions.

One variable about which the results of this study were unambiguous was sex. There was no evidence that the effectiveness of particular reading materials was significantly influenced by the sex of the student. Generally, girls tended to have slightly higher progress rates than boys, but not in a systematic association with particular reading materials.

This study, employing a measure of performance not heretofore used in such assessments, undertook to keep the analyses as simple and straightforward as possible. It included in the analyses only students whose relationship to particular reading materials was as unambiguous as the data would allow. The distribution of reading materials among the students in this study was in similar proportions to that of the overall elementary school population.

Finally, the results presented do not provide support for a decision to eliminate one material as opposed to another based on student progress. Results do suggest that the basis on which particular reading materials are assigned by teachers in relation to the reading instructional level of students is important.

A replication of this study with 1983-84 data would be an assessment of the stability of the present results; however, the evaluation of reading materials in relation to student pre-post test performance would be more desirable.